

No. 3936 A.

LA7375

Recording and Playback Amplifier for VHS Video Recorders

Overview

The LA7375 is a recording and playback amplifier for VHS-format video tape recorders. It features a two-channel playback amplifier and a single-channel recording amplifier, making it ideal for standard-play mode recorders.

The LA7375 operates from a 5V supply and is available in 16-pin DIPs.

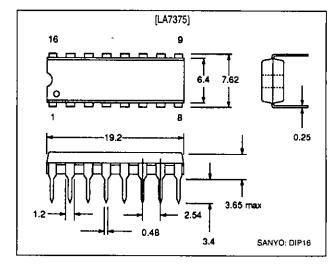
Features

- · Two-channel playback amplifier
- · Single-channel recording amplifier
- · RF envelope detector for automatic tracking
- Constant-current output, high stability recording amplifier
- · Automatic gain control
- 5V supply
- 16-pin DIP

Package Dimensions

Unit: mm

3006B-DIP16



Specifications

Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V _{cc}		7	V
Allowable power dissipation	P _D max	Ta = 65°C	650	mW
Operating temperature	Topr		10 to +65	
Storage temperature	Tstg		-40 to +150	°C

Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Supply voltage	V _{cc}		5	V
Supply voltage range	V _{CC} op		- 4.75 to 5.5	٧

Operating Characteristics at Ta = 25°C

Playback Mode with SW3 = OFF

Parameter	Symbol Condition	Conditions	Ratings				
- arameter	Symbol	Conditions	min typ		max	- Unit	
Supply current	I _{CCP}		23	28	33	mA	
Channel 1 voltage gain	G _{VP1}	V 00-V (400)-	57	60	63	dB	
Channel 2 voltage gain	G _{VP2}	V _i = 38mVp-p, f = 1MHz	57	60	63	dB	
Gain differential	ΔG _{VP}	G _{VP1} – G _{VP2}	-1	0	+1	dB	
Input conversion rms noise voltage	V _{NI}	1.1MHz lowpass filter	-	1.1	1.5	μV	
Frequency response	ΔV_{FP}	V _I = 38mVp-p, f = 1 to 7MHz	-3.5	0	_	dB	
Second-harmonic distortion	V _{HDP}	V ₁ = 38mVp-p, f = 4MHz	_	-40	-35	dB	
Maximum output level	V _{OMP}	f = 1kHz, -30dB harmonic distortion	0.8	1.0	-	Vp-p	
Crosstalk	V _{CR}	V _I = 38mVp-p, f = 4MHz, 8.2µH input inductor short- circuited	_	-40	-35	dB	
Output DC offset voltage between channels	ΔV _{ODC}		-350	0	+ 350	mV	
AGC input level	ΔAGC	f = 4MHz, TP4 = 250mVp-p	300	330	360	mVp-p	
AGC second-harmonic distortion	V _{HDAGC}	V ₁ = 38mVp-p, f = 4MHz		-40	-35	dB	
AGC control level		f = 4MHz, T4 = 500mVp-p	-	1.0	1.5	<u> </u>	
AGO CONTION IEVEN	V _{AGC}	f = 4MHz, T4 = 125mVp-p	-1.2	-0.7	-	→ dB	
Envelope detector quiescent output voltage	V _{ENVQ}	T12 quiescent, no input	0.47	0.52	0.57	V	
		f = 4MHz, T4 = 300mVp-p	2.0	2.25	2.5		
Envelope detector output	_U	f = 4MHz, T4 = 500mVp-p	2.9	3.2	3.5	v	
Envelope detector output	V _{ENV}	f = 3MHz, T4 = 300mVp-p	1.65	1.9	2.15		
		f = 5MHz, T4 = 300mVp-p	2.0	2.3	2.6		
Playback-ON switch ON resistance	R _{PON}	Measured with 1mA and 2mA DC inputs.	-	6	10	Ω	
SW1 threshold level	SW _{RF1}	Channel 1 to 2	1.2	_	1.8		
		Channel 2 to 1	0	_	0.8	٧	
SW2 threshold level	Citt	Channel 1 to 2	3.2	_	4.0	<u> </u>	
SAAT MILEPLION IGABI	SW _{RF2}	Channel 2 to 1	2.2		2.8	٧	

Recording Mode with SW3 = ON

Parameter	Symbol	Conditions	Ratings			
- al allietei		Conditions	min	typ	max	Unit
Supply current	I _{CCR}		50	55	60	mA
Voltage gain	G _{VA}	V _I = 150mVp-p, f = 4MHz	-3.5	-1.5	+ 0.5	dB
Frequency response	ΔV _{FR}	V _I = 150mVp-p, f = 1 to 7MHz	-2	0	-	dB
Second-harmonic distortion	V _{HDR}	f = 4MHz, V _O = 15mVp-p	-	-4 5	-40	dB
Maximum output level	V _{OMP}	f = 4MHz, -40dB harmonic distortion	15	20	-	mVp-p
Muting attenuation	V _{MR}	V _I = 150mVp-p, f = 4MHz	-	-45	-40	dB
Intermodulation distortion	V _{CY}	f _(T8Y) = 4MHz, f _(T8C) = 629kHz, T15A = 150mVp-p, T15 = 40mVp-p		– 45	-40	dB
Luminance and chrominance mixer voltage gain	G _{MIX}	V _I = 150mVp-p, f = 4MHz	9	11	13	dB
REC switch threshold level	SW _{REC}		3.9	_	5.0	V
REC MUTE threshold level	SW _{MUTE}		2.2	-	4.0	V

Measurement Conditions

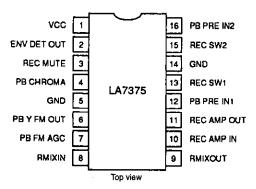
Playback Mode

Parameter	Channel	Test points		Switch positions	
rai ametei		Input	Output	SW30	Mute
Supple current		T1		1	
Voltage gain, frequency response, harmonic distortion, output	1	T16	T4	1	
level and crosstalk	2	T12	T4	2	
Input conversion rms noise level	1, 2		T4	1	
Output DC offset		PB CHROMA	•	1 to 2	
AGC input level, AGC harmonic distortion and AGC control voltage		T16	T6	1	
Envelope detector quiescent current			T2	1	•
Envelope detector output voltages		T16	T2	1	
Playback-ON switch ON resistance	-		T11		
RF SW1 threshold		Т3			1
RF SW2 threshold		Т3			2

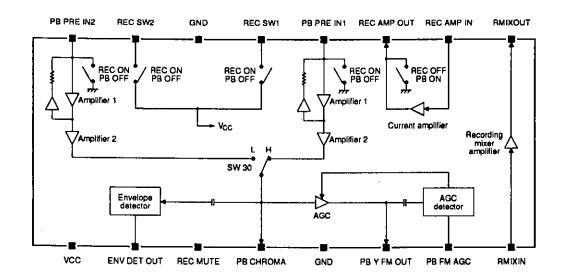
Recording Mode

Parameter	Test	points	Switch positions	
Falanielei	Input	Output	SW30	Mute
Supple current	T1			1
Voltage gain, frequency response, harmonic distortion and output level	T8Y	T15A, T15		1
Muting attenuation	T8Y	T15A, T15	<u> </u>	2
Intermodulation distortion	T8Y, T8C	115A, T15		1
Luminance and chrominance mixer gain	T8Y	T9		1
REC switch threshold	T3			1
REC MUTE switch threshold	Т3			2

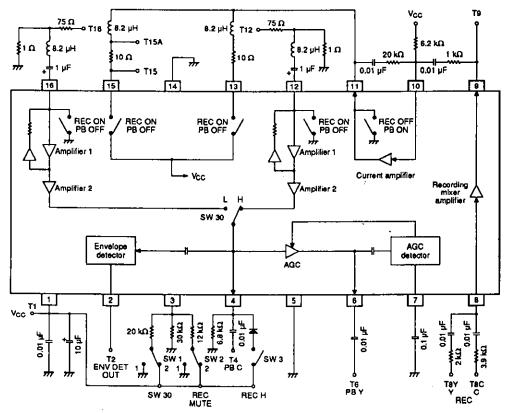
Pin Assignment



Block Diagram

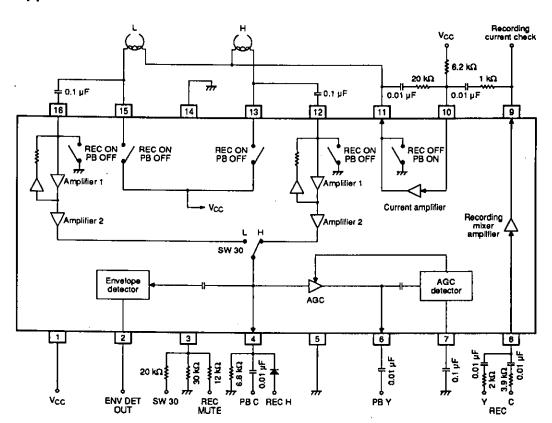


AC Measurement Circuit



Note that the SW30 switch is in the L position when the voltage on pin 3 is 0 to 1V (muting OFF) or 2 to 3V (muting ON), and in the H position when the voltage on pin 3 is 1 to 2V (muting OFF) or 3 to 4V (muting ON).

Typical Application



Pin Functions

Number	Name	Equivalent circuit	Function
1	vcc		5V supply
2	ENV DET OUT	2 100 n 2.5 kg	Playback-mode envelope detector output. Nominal voltages are 0.5V (PB with no signal) and 0V (REC).
3	REC MUTE	3 - Vcc 3 - Vcc 3 - Vcc 3 - Vcc 777	Muting control and playback SW30 switch control input
4	PB CHROMA	V _{CC} (4) 100 µA 100 µA 100 µA 20 kΩ 20 kΩ 3.8 V	Playback chrominance output. Nominal voltages are 2.0V (PB) and > 3.8V (REC).
5	GND		Ground
6	PB Y FM OUT	-V _{CC} -V _{CC} -V _{CC} -V _{CC} -V _C -	Luminance FM output. Nominal voltages are 2.5V (PB) and 4.0V (REC).
7	PB FM AGC	100 Ω 10 kΩ 15 kΩ 777	Playback AGC detector output. Nominal voltages are 1.5V (PB) and 0V (REC).
8	AMIXIN	1.8 kΩ P P P P P P P P P P P P P P P P P P	Recording-mode mixer amplifier input. Nominal voltages are 2.1V (PB) and 1.65V (REC). Gain is 11dB when R is $2k\Omega$, and 6dB when R is $3.9k\Omega$.
9	RMIXOUT	V _{CC} 100 Ω 9 1 mA	Recording-mode mixer amplifier output. Nominal voltages are 4.1V (PB) and 1.8V (REC).

Number	Name	Equivalent circuit	Function
10	REC AMP IN	1 mA 8 1 kg	Recording-mode current amplifier input. Nominal voltages are 1.77V (PB) and 1.85V (REC).
11	REC AMP OUT	Switching transistor	Recording-mode current amplifier output. Nominal voltages are 0V (PB) and 4.2V (REC). Switching transistor ON resistance is 5Ω .
12	PB PRE IN1	Switching 12 transistor 20 kg 777	Playback-mode preamplifier input. Nominal voltages are 0.7V (PB) and 0V (REC). Low-noise input transistor.
13	REC SW1	V _{cc}	Recording-mode switches. Nominal voltages
15	REC SW2	40 kΩ (3) (5)	are 0V (PB) and 4.2V (REC).
14	GND		Preamplifier ground
16	PB PRE IN2	Switching 18 Transistor 20 kg 777	Playback-mode preamplifier input. Nominal voltages are 0.7V (PB) and 0V (REC). Low-noise input transistor.

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